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Synthesis of Lessons Learned on Costs and Financing of Maternal Health Pilot Projects in West Africa

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Abstract

In November 1998, PHR conducted a rapid assessment of costs and financing of four pilot projects as part of the SARA/CEFOREP's (Support for Analysis and Research in Africa and *Centre de Formation et de Recherche en Santé de la Reproduction*) regional assessment of programs to reduce maternal mortality through the provision of emergency obstetrical care (EOC) in Mali, Burkina Faso, Benin, and Senegal. The objective of the overall evaluation of these four projects was to identify successful models for providing EOC care services in francophone Africa. This paper presents lessons learned of conducting the rapid assessment of available project costs/expenditures and financing.

The results indicate that a rapid assessment of costs/expenditure and effectiveness data is useful for obtaining general descriptions of the types of expenditures expended for these projects and determining sources of finance and some information on expenditures. The data collected during a week in each country were not, however, sufficient to determine total expenditures or cost-effectiveness of each project. The difficulty in obtaining sufficient data for a cost analysis is related to several factors: 1) information on costs/expenditures are not monitored on a regular basis in any of the four projects; 2) management of finances often takes place at central levels rather than at local levels; 3) some data are only obtainable through observation or interview and requires additional time; and 4) data on the percent of transfers to regions for specific activities is often difficult to obtain.

In some cases, information on effectiveness was particularly limited, particularly when the project was conducted with government funding without external involvement. While considerable (but not complete) information were available for the Mali and Burkina Faso pilots, data available for the pilot projects in Benin and Senegal were too limited to evaluate either costs or effectiveness. This is a serious drawback to the projects, lowering the likelihood that such projects will be replicated in other areas.

The limited availability of data on costs/expenditures suggest that program managers are often unaware of the costs/expenditures of the services that they are providing, even when conducting pilot projects. Without this information, the extent to which their costs are being recovered through charges cannot be evaluated and the long-term sustainability potential of the pilot projects cannot be determined.

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Acronyms

BADC	Belgian Administration for Development Cooperation
CIDA	Canadian International Development Agency
CREDESA	*Centre Régional pour le Développement et la Santé*
CSC	*Centre de Santé de Reference* (Sub-district (Circle) Health Center)
CSCOM	*Centre de Santé Communautaire* (Community Health Sub-center)
CSSP	*Centre de Santé de Sous Prefecture* (Sub-district Health Center)
EOC	Emergency Obstetrical Care
FCFA	*Franc de la Communauté Francophone d'Afrique*
FED	*Fond Européen Développement*
IEC	Information, Education, Communication
IMR	Infant Mortality Rate
PHR	Partnerships for Health Reform
TFR	Total Fertility Rate
USAID	United States Agency for International Development
WHO	World Health Organization

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1. Introduction

In November 1998, the Partnerships for Health Reform (PHR) project conducted a rapid assessment of costs and financing of four pilot projects on emergency obstetrical care (EOC). The PHR assessment was done as part of a regional assessment, by Support for Analysis and Research in Africa/*Centre de Formation et de Recherche en Santé de la Reproduction* (SARA/CEFOREP), of programs to reduce maternal mortality through the provision of EOC in Mali, Burkina Faso, Benin, and Senegal (Toure 1997). The objective of the overall evaluation of these four projects was to identify successful models for providing EOC care services in francophone Africa. This study is similar to the MotherCare Project's assessment of maternal health interventions in three anglophone African countries (MotherCare 1998).

This paper presents lessons learned of conducting a rapid assessment of maternal health project costs/expenditures, financing, and effectiveness in the four West African countries. It examines how much of the necessary information to evaluate costs and effectiveness can be collected in a short time, the adequacy of this information, and whether further additional data collection and analysis is merited to present/evaluate models for providing EOC care services in francophone Africa.

The paper first presents background information on maternal health indicators in the four francophone countries and descriptions of the four projects. Then it presents the information collected on expenditures, sources of financing and effectiveness during the rapid assessment. Lastly a discussion of the adequacy of the data collected as well as usefulness of conducting further analyses is elaborated.

2. Background: Description of Four Maternal Health Pilot Projects

All of the countries in the assessment are low-income, with GNP per capita less than US$ 550, and public expenditure on health fairly low, particularly in Benin and Senegal (Table 1).

Table 1. Socioeconomic and Health Indicators by Country

Country	GNP per capita (US$)	% public expenditure on health	MMR	MMR based on WHO/UNICEF model	IMR	TFR
Mali	260	2.0	580/577	1200	144/123	6.5
Burkina Faso	250	4.7	–/566	930	109/–	6.5
Benin	380	1.7	500/473	990	101/106	5.8
Senegal	540	1.2	560/510	1200	70/60	5.5

Source: WHO 1996, www.unicef.org/statistics, www.who.int.infosources.whosis

In each of the four countries, health indicators indicate that maternal and infant mortality is high. The maternal mortality ratios based on World Health Organization (WHO) and UNICEF statistics are 500 or more women per 100,000 live births (WHO 1996). Because this ratio is often an underestimate, Table 1 also shows the ratios based on a WHO/UNICEF model that estimates ratio magnitude for countries that have limited data on maternal mortality. These estimated maternal mortality ratios are much higher—ranging from 930 to 1200 women per 100,000 live births for the countries in this study. These high ratios indicate the magnitude of the problem of maternal mortality in these countries.

Other indicators associated with maternal mortality, such as infant mortality rates (IMR) and total fertility rates (TFR), are also shown. IMR's range from 101 to 144 for Mali, Burkina Faso, and Benin; Senegal's is slightly lower. TFRs are higher in Mali and Burkina Faso (6.5), lower in Benin and Senegal (5.8 and 5.5).

Utilization of maternal health services varies among the four countries. The percentage of pregnant women that had at least two to three prenatal care visits ranged from a low of 40 percent in Mali to a high of 77 percent in Senegal (Table 2). In three of the four countries (the exception was Benin), fewer than half of deliveries took place with a trained attendant.

Table 2. Utilization of Maternal Health Care by Country (in percent)

Country	At least one prenatal visit	2-3 prenatal visits	Delivery with a trained attendant
Mali (1995/96)	49	40.3	40
Burkina Faso (1993)	60	52	42
Benin (1996)	80	76.2	64
Senegal (1997)	83	77	46.6

Sources: Ministère de la Santé et al., Mali 1995/96, Institut National de la Staistique et de la Demographie, Burkina Faso 1993, Ministère de la Santé et al, Benin 1996, Ministère de la Santé et al., Senegal 1997

Because of the high levels of maternal mortality in these four countries, projects to promote safe motherhood have been initiated. In each of the countries, the ministry of health and agencies working in maternal health have identified the delays in treating obstetrical emergencies as a major cause of maternal morbidity and mortality. Those identified were: (1) delay in deciding to seek care, (2) delay in reaching health facilities, and (3) delay in receiving adequate care (Toure 1997). In each country, a pilot project was designed to decrease these delays and improve service accessibility. A description of each activity provides an opportunity for comparison.

2.1 Mali

Many factors contribute to the problem of high maternal morbidity and mortality in Mali. Utilization of maternal health services—including use of a trained professional during delivery—is relatively low. In addition, poor roads and vehicles as well as insufficient financial resources delay emergency evacuations.

In 1995–96, information was gathered on the condition of EOC in order to build consensus among the government, community, and donors and to implement a planning strategy. In 1997 the Ministry of Health in collaboration with UNICEF began a program to reduce the delays in obtaining EOC. Improvements were made to the referral and transport systems for obstetric emergencies. The program has been tested in seven sub-districts (*cercles*, or circles) and one commune of the capital city of Bamako.

The pilot project evaluated by PHR is in the sub-district of Kolokani. Kolokani is located 125 km from Bamako and has a population of 187,920. The region's health facilities provide basic preventive and curative care in obstetrics as well as emergency injury treatment for adults and children. The sub-district health center (*centre de santé de reference*, CSC) is capable of performing surgery and radiological and laboratory exams.

The objective of the pilot project is to improve the timeliness of referrals through improving the communications between health system levels, increasing access to transport, and upgrading the EOC facilities at the district hospital. Activities thusfar have included equipping health centers with communications equipment, purchasing an ambulance, upgrading facilities at the district hospital by supplying medical equipment and kits with medicines, equipping and maintaining a generator, purchasing a bicycle, and recruiting a surgeon and community personnel. In addition, discussions were held with the community and a consensus was reached concerning cost sharing for emergency referrals. It was decided that the community health sub-center (*centre de santé communautaire*, CSCOM) would support 50 percent of the cost to the health center of evacuating an EOC case, the

CSC would support 25 percent, and the patient would support 25 percent. The project improvements and the new cost-sharing formula significantly reduced costs to the client, from FCFA 70,000–80,000 to FCFA 7500.

The tariff for curative health consultations was increased from FCFA 300 per visit to FCFA 400 per visit and the extra FCFA 100 was put into a separate account for emergency cases. (Preventive care tariffs remained at FCFA 300 per consultation.) The emergency account collects approximately FCFA 40,000 a month from the community through tariffs, for a total of FCFA 480,000 in 1997.

After one year, tariffs were readjusted based on the population coverage and the number of evacuations performed. For example, the CSCOM of Massantola now pays FCFA 10,035 per month for an average of two emergency cases, Dideeni pays FCFA 22,750 for two cases, Nonsombougou pays FCFA 19,285 for three cases, and Sabougou pays FCFA 20,000 for two cases. In 1997 the account received an additional contribution of FCFA 1,720,000 from the CSCOMs. The remaining funds at the end of the year totaled FCFA 560,000.

2.2 Burkina Faso

After the government announced a policy of improving access to EOC in 1995, UNICEF began a project that had the objective of reducing maternal mortality by 50 percent by the year 2000. The pilot site was the Regional Hospital Center of Fada NGourma, located 300 kilometers east of the capital, Ouagadougou. UNICEF funded a number of activities to improve the quality of obstetrical care there: upgrading the operating theater, training hospital personnel in EOC, improving the referral system for EOC with communications equipment, and funding supervision, evaluation, and monitoring.

Special attention was paid to reducing one type of delay in obtaining emergency surgery: poor access to the requisite drugs and supplies. Because prior to surgery, patients' families had to obtain prescriptions for the necessary drugs and supplies, raise money, and then purchase the drugs and supplies—if they were available at pharmacies—the delay in obtaining EOC was often lengthy.

To avoid such delays, the project developed kits containing the necessary drugs and supplies for obstetrical surgery for sale at a reduced price to consumers. The fee of FCFA 15,000 represented a 60 percent discount for the drugs and supplies valued at FCFA 38,000. Sale of the kits at the Regional Hospital Center of Fada NGourma began in 1996.

A year later, kits were introduced at Yalgado Ouedraogo Hospital in Ouagadougou. The government provided initial funding—a line of credit of FCFA 500 million was announced by the prime minister for the Yalgado Hospital and other hospitals. Despite this, the kits are often incomplete and the clients' families are obliged to purchase additional drugs and supplies after paying the mandatory FCFA 15,000.

2.3 Benin

In Benin, the move to improve EOC is being undertaken by an ongoing broader effort to improve the country's health care. The Regional Center for Development and Health (*Centre Régional pour le Développement et la Santé*. CREDESA) is implementing an operations research project based on health that began in 1990, following a health development project that took place from 1983–89. The project has received funding from Swiss Cooperation and CIDA. The operating

expenses are funded through user fees. The activities began at the sub-district of Ouidah but then were expanded to nine communes in other regions of the country.

CREDESA implements a range of health activities that include maternal health care activities, using a multi-sectoral, multi-disciplinary, bottom-up participatory approach. The project works with health workers at each level of the health system to improve EOC services. The health activities are combined with income-generating activities.

Health system levels in Benin include community health agents, health sub-centers (*complexe communal de santé*, CCS) at the commune level, and health centers (*centre de santé de la circonscription urbaine*) at the sub-district level. In 1995, the services began to decline as the Ministry of Health suspended supervision services and political and economic difficulties increased. Community health agents in Ouidah have not been active since 1996, although service provision continues at the level of the commune and sub-district.

In light of these problems, the maternal health problem identified for resolution was the slow referral of patients, due to poor communication between different levels of the system and poor transport.

In 1995, the referral system was improved through the acquisition of an ambulance and the introduction of radio equipment for communication between the CCS and the sub-district health center (c*entre de santé de sous prefecture*, CSSP) at Ouidah. In this way, midwives at the seven CCSs can communicate with the doctors at the hospital as well as call for the ambulance for emergency evacuations when required.

2.4 Senegal

The EOC pilot project was started in 1996 by the Le Dantec University Teaching Hospital of the Obstetrics and Gynecology Clinic of Dakar. Although mostly funded with government resources, some external funding was used to upgrade an operating theater at one pilot site. EOC problems addressed in the pilot sites were lack of personnel and poor communication between hospitals and health centers.

The first pilot site is Tambacounda, located 450 km from the capital of Dakar. The project places interns in their fourth year of training in obstetrics/gynecology for four to six months in the Tambacounda Regional Hospital so that obstetrical surgery can take place in the region. This avoids long evacuations (250–451 km) to Dakar or a regional hospital that can perform emergency obstetrical surgery. Unfortunately the interns receive no supervision during their stay in Tambacounda.

The second pilot site is the Roi Baudoin Health Center in Guédiawaye, 15 km outside of Dakar. The project placed an obstetrical gynecologist and a doctor specializing in obstetrics/gynecology in the facility. In addition, an operating theater was constructed for the center and equipped with funding from the Belgian Administration for Development Cooperation (BADC). Finally, forms were designed so that the Obstetrics and Gynecology Clinic in Dakar and the health center can exchange information and determine causes of any delays in evacuation

3. Methodology of the Study

In October 1998, a team of health professionals spent a month visiting the pilot projects described in the preceding chapter. Approximately a week was spent in each country. As part of the team, PHR's health economist collected information on expenditures, financing sources, and effectiveness of the projects. He could not collect information on costs, because time was too short.[1]

Capital expenditures, or expenditures for goods that have a useful life for more than one year, included the following categories: building, vehicles, equipment, and long-term training. Recurrent expenditures, or expenditures for goods that last for less than a year, included the following categories: personnel, drugs and supplies, maintenance and utilities, information, education and communications (IEC), short-term training, and transport.

Data collection was incomplete for two main reasons. First, while information for external sources of funding was often available, government expenditures such as those for personnel salaries were not as easily obtainable. This information usually needs to be collected at central offices in the capital city or district capital, because these resources are not financially managed at the level of the facility. Second, as noted above, data on costs were not collected for lack of time. Information used to estimate costs is detailed and certain aspects of it are more time-consuming to collect than is expenditure data, for example, certain information on unit costs (e.g., unit costs of drugs) or personnel time allocation. In the case of the project in Benin, data on start-up costs were not available since the project no longer had its original sources of funding.

[1] Expenditures differ from costs in that they reflect amounts that are allocated rather than actually used, do not annualize capital costs, and do not value in-kind contributions such as volunteer time.

4. Findings on Expenditures on and Effectiveness of Projects

This chapter presents the assessment's findings on expenditures and effectiveness of the maternal health projects. Sources of financing for the project and the cost-sharing role of the clients are discussed. Because the data on expenditures that were collected are not comprehensive, only partial findings are described.

4.1 Mali

4.1.1 Expenditures

In the Mali pilot project, the greatest expenditures in 1997 were, as expected, for the start-up capital investments of building, equipment, and vehicles (Table 3). Recurrent expenditures were for personnel time and bonuses, drugs and supplies, maintenance and utilities, IEC, and transport.

The recurrent expenditures were financed by two sources: the government and the community fees from other services. The government funds regular personnel costs, and the community fees finance other recurrent costs such as locally recruited personnel, maintenance costs, and transport maintenance. The third source of financing, UNICEF, paid for equipment and the ambulance for the project.

Table 3. Project Expenditures in Kolokani Health Center, Mali, 1997, by Financing Source (in FCFA)

Financing Category	Government	UNICEF	Community	Total
Capital Expenses				
Building/Equipment	85,750,000			85,750,000
Vehicles (ambulance)*		10,872,750		10,872,750
Communication equipment*		12,600,000		12,600,000
Recurrent Expenses				
Personnel	Bonuses:3664		Salaries: 1,698,000	145,164
Drugs/Supplies			296,140	296,140
Maintenance/Utilities			Generator: 66,000 Ambulance: 283,955	349,955
IEC		1,900,000		1,900,000
Transport	240,000		240,000	480,000
TOTAL	FCFA 85,993,664	FCFA 25,372,750	FCFA 1,027,595	FCFA 112,394,009 ($197,182)

*Taxes were not imposed on equipment for this project.
** Salaries per month: instrumentalist: 20,000, driver: 20,000, nurses: 20,000, guard: 17,500, cleaner: 18,500, washer: 18,500, drug dispensary: 27,000

The costs of transport is estimated to be about FCFA 10,000 ($17.50) and is divided among three sources of finance—50 percent to the community health center, 25 percent by the referral health center, and 25 percent by the client.

4.1.2 Effectiveness

Although data were available only for the first year of the project, Table 4 indicates that, in that year, the project succeeded in reducing delays in obtaining EOC. The number of evacuations (received) increased, the number of cesarean section deliveries increased, and maternal deaths decreased. Overall, the average length of time from decision to evacuate to reaching the referral hospital was reduced from 1-2 days to two hours.

Table 4. Number of Evacuations, Cesarean Sections, and Maternal Deaths before/after First Year of Project in Kolokani Health Center, Mali

Year	No. of (Expected) Evacuations	No. of Evacuations Received	% Evacuations Received/ Expected	No. of Cesarean Sections	Maternal Deaths at Hospital	% of Deaths/Cesarean Sections
1996	51	31	60.8%	30	5	16.1%
1997	52	47	90.4%	47	1	2.1%

Note: The population of Kolokani sub-district in 1997 was 187,920.

When the origin of the evacuations is examined, it is clear that much of the increase in evacuations came from rural areas of the district (Table 5). In fact, the number of evacuations from the rural areas increased threefold in the first year.

Table 5. Number of Evacuations from Rural Areas before/after First Year of Project in Kolokani Health Center, Mali

Center	1996	1997
Massantola	3	6
Sabougou	8	13
Didieni	6	15
Nonsombougou	0	11
Total	17	45

4.2 Burkina Faso

4.2.1 Expenditures on Fada NGourma Project

The expenditures on the pilot project at Fada NGourma in Burkina Faso are shown in Table 6. The recurrent expenditures are larger than the initial start-up costs due to the high cost of maintenance and utilities and the project's focus on provision of drugs kits rather than on improvements in transport or communications systems.

Table 6. Project Expenditures in Fada NGourma Regional Hospital, Burkina Faso, 1997, by Financing Source (in FCFA)

Financing Category	Government	UNICEF	Community	Expenditures
Capital Expenses				
Building		29,000,000		29,000,000
Vehicles		12,000,000		12,000,000
Initial training		3,000,000		3,000,000
Recurrent Expenses				
Personnel	11,100,000			11,000,000
Medical supplies			*7,873,265	7,873,265
Transport			1,115,660	1,115,660
Building upkeep	48,069,750			
TOTAL	FCFA 11,100,000	FCFA 92,069,750	FCFA 11,137,955	FCFA 114,307,705

*Kits were initially purchased by UNICEF

UNICEF paid for most of the initial expenditures of the project at Fada NGourma. In later years, most of the expenditures will be assumed by the government and the community, because the primary expenses will be for the costs of the kits and their components.

4.2.2 Effectiveness of Fada NGourma Project

The maternal health indicators shown in Table 7 indicate that during the first year of the project, the delay in obtaining EOC at the hospital was reduced. Twice as many cesarean section deliveries were conducted in 1997 than in 1995 and 1996. The number of maternal deaths also declined from an average of 21 in 1995 and 1996 to seven in 1997. However, since the project did not reduce the delay in getting to the hospital, other complications, such as uterine rupture and hemorrhage during delivery, did not decrease.

Table 7. Maternal Health Service Indicators before/after First Year of Project in Fada NGourma Regional Hospital, Burkina Faso

Indicator	1995	1996	1997
Births	1004	1233	1238
Live births	987	1022	1157
Still births	83	80	81
Evacuated	4	1	5
Uterine rupture	15	10	18
Hemorrhage during delivery	3	7	12
Ectopic pregnancy	5	3	4
Cesarean section	82	81	161
Maternal deaths	18	24	7

Note: The population in 1996 was 1,044,154.

In Fada NGourma, cost recovery has been highly successful. Over 90 percent of clients have paid for their kits.

4.2.3 Expenditures at Yalgado Hospital, Ouagadougou

Because no upgrades were made to the operating theater at Yalgado Hospital, additional expenditures were limited to those for the kits. The total expenditures on the kits was nearly FCFA 21.8 million.[2] All of the financing for the project was from the government.

Table 8. Project Expenditures at Yalgado Hospital, Ouagadougou, Burkina Faso, by Financing Source (in FCFA)

Expenditure	Government
Kits	21,790,000
Personnel	–

4.2.4 Effectiveness of Yalgado Hospital

The project at Yalgado Hospital would be expected to be less successful than that in Fada NGourma, because the EOC kits were often incomplete while the cost to the consumer remained the same (FCFA 15,000). In addition, the facilities had not been upgraded nor an ambulance purchased, as at Fada NGourma Hospital. Nevertheless, some improvement in reducing delays in obtaining EOC took place during the one year that the project had been in place at the time of the study, although it was less dramatic a reduction than that of Fada NGourma. Table 9 shows that the number of cesarean section deliveries increased from an average of 878 for the years 1994–1996 to 957 in 1997. The number of maternal deaths decreased from an average of 144 to 101 and postoperative deaths from 27 to 18.

Table 9. Maternal Health Indicators at Yalgado Hospital, Ouagadougou, Burkina Faso

Indicator	1994	1995	1996	1997
Births	3142	3513	3936	2856
Live births	NA	2992 (85%)	3503 (89%)	2397 (84%)
Uterine rupture	93	80	77	69
Hemorrhage during delivery	55	73	86	94
Cesarean sections	802	926	906	957
Maternal deaths	128	123	180	101
Postoperative deaths	25	29	27	18

Note: Population in 1996 was 752,216.

[2] Some additional personnel time may be associated with administration of the kits. However, no information on this additional cost was collected.

Cost recovery also was less successful at Yalgado Hospital (51.1 percent) than at Fada NGourma Hospital, since the kits are often incomplete and the population perceives that the government should pay for the kits.

4.3 Benin

4.3.1 Expenditures

Table 10 shows the information available on expenditures on the CREDESA project in Benin. While this information is incomplete, it gives some indication of the types of expenditures and their sources that were allocated for the project.

International donors financed the capital costs of the project, while the government paid for the personnel costs at the health complex. The revenue from fees is financing the recurrent expenditures: salaries of additional personnel, drugs and supplies, maintenance and utilities, and supervision and training.

Table 10. Sources of Financing on Benin Maternal Health Project

Financing Category	Government	International donors (Swiss Cooperation and CIDA)	Community
Capital Expenses			
Building		CCS	Village health unit
Communication equipment (radio)		CCS, CSSP & hospital FCFA-2,500,000 each	
Recurrent Expenses			
Personnel	CCS	Salary of second midwife, and first midwife in 1997	FCFA 256,792
Drugs/Supplies			FCFA 1,078,530
Maintenance/Utilities Supervision/Training			Village health unit revenue FCFA 256,792

4.3.2 Effectiveness

Despite the fact that the project is still taking place at the facility levels, the village health worker is no longer active and this change has had a dramatic effect on the effectiveness of the project. Table 11 indicates that the number of evacuations have decreased dramatically starting in 1997. The number of reported maternal deaths, though, has stayed the same and has not increased.

Table 11. Number of Evacuations, Caesarian Sections and Maternal Deaths since 1993, Pahouignan CCS, Benin

Year	Evacuations	Cesarean Sections	Maternal Deaths
1993	8	4	0
1994	16	9	0
1995	26	10	2
1996	26	5	0
1997	7	3	0
1998	7	4	0

Note: The population in 1983 was 9,876.

4.4 Senegal

4.4.1 Expenditure on Tambacounda Regional Hospital Project

Because the project at the Tambacounda Regional Hospital only involved the placement of the obstetrics-gynecology interns and the funding is taken from transfer funding sent to the region, the expenditures associated with placing the intern could not be determined. It should also be noted that since the intern was replacing the obstetrical gynecologist who should be posted at the region, the additional expenditures associated with the placement would have been incurred as routine if the hospital were fully staffed.

4.4.2 Effectiveness at Tambacounda Regional Hospital

The measures of effectiveness are limited since they are only for two points in time. However, they suggest that use of the regional hospital has increased for deliveries during the three-year period. It is not clear why this is the case and whether it is associated with the introduction of the placement of the interns. More information is required to determine the reason for this increased utilization of the facility. However, it is clear that placement of an intern at a regional hospital does not address some of the other issues that cause delays in access to EOC, for example, whether a communication system exists between lower levels of a health system and the hospital, whether access to transport for evacuations is available, and whether lower level personnel can recognize complications quickly.

Table 12. Maternal Health Indicators at Tambacounda Regional Hospital, Senegal

	Second Half 1993	Second Half 1996
Normal deliveries	159	431
Still births	53 (33%)	82 (19%)
Premature	15 (10%)	23 (5%)

Note: The population in 1996 was 470,000.

4.4.3 Expenditure on Roi Baudoin Health Center

Although the quantity of expenditures were not collected for the intervention at the Roi Baudoin Health Center, additional expenditures will be incurred for the following components: additional hours for the personnel to be on call 24 hours a day (midwives, nurses, community health agents, drivers, and cleaners), and upgrading of the operating theater.

The sources of finance for the project were the government, the health committee, BADC, and the European Development Fund (*Fond Européen Développement* [FED]). The investments in the operating theater were financed by BADC, the FED financed a gynecologist, the salaries of other personnel were financed by the government and health committees, and other recurrent costs were financed by the health committee.

4.4.4 Effectiveness at Roi Baudoin Health Center

In 1997, the operating theater did not function continuously, resulting in 37 evacuations. However, starting in 1998, the theater was open continuously and no evacuations for obstetrical reasons were required. In addition, the number of deliveries conducted at the facility almost doubled, increasing from 3,481 in 1996 to 6,022 in 1997 (Assani and Zoumana, 1998). However, it is still too early to effectively evaluate the intervention.

Table 13. Evaluations in 1997 and the First Half of 1998, Roi Baudoin Hospital, Senegal

Evacuations	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total 1997	1st Qtr	2nd Qtr
Obstetrical	7	11	8	11	37	–	–
Surgical	6	8	8	1	23	2	3
Total	13	19	16	12	60	2	3

Note: The population in 1996 was estimated to be 400,000.

5. Discussion

The results indicate that a rapid assessment of costs/expenditure and effectiveness data is useful for obtaining general descriptions of the types of expenditures expended for these projects and determining sources of finance. The data collected during a week in each country were not, however, sufficient to determine total expenditures for each pilot project or to conduct cost-effectiveness assessments of the projects.

Data on expenditures and financing obtained during the rapid assessment were more likely to be those of donor expenditures and community revenue. This information typically is better documented due to donor project requirements and/or for accountability reasons. However, since these projects are not monitoring indicators of expenditures and financing, other information that is less well documented on costs/expenditures is less likely to be available.

Some information required to assess total expenditures or unit costs was not available during the rapid assessment. Since much of the data collection took place at the project sites, information such as government expenditures on personnel salaries and other resources was not easily obtainable. This information usually needs to be collected at central offices in the capital city or district capital since these resources are not financially managed at the level of the facility. Second, some information used to calculate costs is more time-consuming to collect than is information on expenditures; this includes information on unit costs (e.g., unit costs of drugs) and personnel time allocation. In the case of the project in Benin, data on start-up costs were not available since the project no longer had its original sources of funding.

While considerable (but not complete) data were available for the Mali and Burkina Faso pilot projects, limited data were available to evaluate either expenditures or effectiveness for the pilots in Benin and Senegal. This is a serious drawback to those projects, lowering the likelihood that such projects will be replicated in other areas of the countries.

The limited availability of data on costs/expenditures suggest that program managers are often unaware of the costs/expenditures of the services that they are providing, even when conducting pilot projects. Without this information, the extent to which their costs are being recovered through charges cannot be evaluated and the long-term sustainability potential of the pilot projects cannot be determined.

5.1 Financing of Projects

Three sources of financing were identified: donor funding, government funding, and community revenues. Donor funding was generally used to finance the start-up investments of the projects, government funding the personnel salaries, and community revenues the non-regular personnel costs and other recurrent costs.

It is still too early to reach any conclusions about the various projects' financial sustainability. However, experience has shown that projects are less likely to be financially sustainable where cost recovery is low (as in Yalgado Hospital in Burkina Faso) or where the government is not supportive

of the project (as in the case of Benin) and more likely to be sustainable when the community is involved in the financing of the project (as in Kolokani in Mali).

Since patient revenues play an important role in financing the pilots, it is important that these projects consider the limited access to cash that patients' families have for emergency obstetrical care. The pilot projects addressed the problem of limited access to cash in various ways, including subsidizing fees for transport, service charges, and kits of medicines and supplies. However, patients' families still encountered difficulties in raising funds rapidly to pay for the fees for transport, kits, or service. An alternative mechanism that should be considered is the use of mutual health organizations. The benefit of mutual health organizations is that households can pay ahead of time for their health care and share the risk that a woman in labor will need to be evacuated and/or require a cesarean section delivery. Then, when an emergency occurs, no delay in obtaining cash for emergency care will take place. Several such plans currently exist in West African countries (Atim 1998).

Another financing option is for health institutions to offer prepayment plans for maternal health care. For example, a one-time fee could cover all the necessary prenatal care, delivery services, and evacuation, if necessary.

5.2 Additional Data Collection and Analyses

The rapid assessment of costs/expenditures and financing of the four projects did not obtain enough information to determine total expenditures, the unit costs or cost-effectiveness of the projects. However, it did provide a general description of the projects, their objectives, their sources of finance, and a general indication of whether they could be considered successful models for providing EOC care services in francophone Africa. It also showed which projects had enough information to conduct further analyses on unit costs and cost-effectiveness.

A more in-depth study of expenditures, costs, and effectiveness should take place for the more successful projects, including the pilot in Mali and possibly the one at Fada NGourma in Burkina Faso, to assess the cost-effectiveness of these pilot projects. The other projects are unlikely to yield sufficient data to merit additional study.

Projects should establish baselines, objectives, and a monitoring and evaluation plan for costs and financing information so that they can ensure that they have the information, can assess what features have made the projects more or less effective, and address issues in the project design in a timely manner.

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